Claims

[1]   A system for broadcasting MPEG-4-based stereoscopic video data on the Internet, comprising:

an encoding server for encoding stereoscopic video data, audio data, and Object Descriptor/Binary Format for Scene (OD/BIFS) which is information for controlling a content, into elementary stream (ES) having a Moving Picture Experts Group (MPEG)-4 structure;

a Web server for receiving from the client any one among two-dimensional video display mode, field-shuttering video display mode and frame-shuttering video display mode; and

a streaming server for generating a real-time transport protocol (RTP) packet for real-time data transmission on the Internet by multiplexing the ES based on the display mode inputted into the web server, and transmitting the RTP packet to the client.

[2]   The system as recited in claim 1, wherein the encoding server includes:

an encoding unit for encoding the stereoscopic video data, the audio data and the OD/BIFS into ES having a structure of MPEG-4 temporal scalability (TS);

an encoding parameter unit for providing encoding information having a size of an image and the number of frames to be encoded, to the encoding unit;

an MPEG 4 (MP4) file generating unit for generating an MP4 file by adding metadata to the ES; and

a storage for storing the MP4 file.

[3]   The system as recited in claim 2, wherein the encoding unit includes:

an OD/BIFS encoding module for encoding the OD/BIFS data;

an audio encoding module for encoding the audio data;

a video encoding module for encoding the stereoscopic video data; and

an Elementary Stream Interface (ESI) information generating module for generating additional information needed for the transmission and decoding of the ES.

[4]   The system as recited in claim 3, wherein the video encoding module includes:

a field separating module for separating the stereoscopic video data into a left-eye odd field, a left-eye even field, a right-eye odd field and a right-eye even field;

a base layer encoding module for encoding the left-eye odd field; and

an enhancement encoding module for encoding the left-eye even field, the right-eye odd field and the right-eye even field.

[5] The system as recited in claim 4, wherein the enhancement encoding module allocates the left-eye even field to a first enhancement layer; the right-eye odd field to a second enhancement layer; and the right-eye even field to a third enhancement layer, and encodes the left-eye even field, the right-eye odd field and the right-eye even field based on the MPEG-4 TS structure.

[6] The system as recited in claim 4, wherein the MP4 file generating unit generates an MP4 file by giving one ES identification (ES_ID) to a set of a left-eye odd field, a left-eye even field, a right-eye odd field and a right-eye even field in the ES.

[7] The system as recited in claim 4, wherein if a display mode inputted from the web server is a two-dimensional video display mode, the streaming server transmits an ES of a left-eye odd field and a left-eye even field to the client; if the display mode inputted from the web server is a field-shuttering display mode, the streaming server multiplexes an ES of the left-eye odd field and the right-eye even field sequentially and transmits the ES to the client; and if the display mode inputted from the web server is a frame-shuttering display mode, the streaming server multiplexes an ES having the left-eye odd field, left-eye even field, right-eye odd field and the right-eye even field fields sequentially and transmits the ES to the client.

[8] A method for broadcasting stereoscopic video data to a client on the Internet based on MPEG-4, comprising the steps of:

a) encoding stereoscopic video data, audio data, and Object Descriptor/Binary Format for Scene (OD/BIFS) which is information for controlling a content into ES having an MPEG-4 structure;

b) receiving any one among two-dimensional video display mode, field-shuttering video display mode and frame-shuttering video display mode from the client; and

c) generating an RTP packet for real-time transmission on the Internet by multiplexing the ES based on the inputted display mode, and transmitting the RTP packet to the client.

[9] The method as recited in claim 8, wherein the step a) includes the steps of:

a1) encoding the stereoscopic video data into ES having a structure of MPEG-4 TS;

a2) generating an MP4 file by adding metadata to the ES; and

a3) storing the MP4 file in a storage.

[10]   The method as recited in claim 9, wherein the step a1) includes the steps of:

a1-1) encoding the OD/BIFS data;

a1-2) encoding the audio data;

a1-3) encoding the stereoscopic video data; and

a1-4) generating additional information needed for the transmission and decoding of the ESs.

[11]   The method as recited in claim 10, wherein the step a1-3) includes the steps of:

a1-3a) separating the stereoscopic video data into a left-eye odd field, a left-eye even field, a right-eye odd field and a right-eye even field;

a1-3b) encoding the left-eye odd field; and

a1-3c) encoding the left-eye even field, the right-eye odd field and the right-eye even field.

[12]   The method as recited in claim 11, wherein, at the step a1-3c), the left-eye even field is allocated to a first enhancement layer; the right-eye odd field is allocated to a second enhancement layer; and the right-eye even field is allocated to a third enhancement layer; and the left-eye even field, the right-eye odd field and the right-eye even field are encoded based on the MPEG-4 TS structure.

[13]   The method as recited in claim 11, wherein, at the step a1-3c), an MP4 file is generated by giving one ES_ID to a set of a left-eye odd field, a left-eye even field, a right-eye odd field and a right-eye even field in the ES.

[14]   The method as recited in claim 11, wherein, at the step c), if a display mode inputted from the web server is a two-dimensional video display mode, an ES having a left-eye odd field and a left-eye even field is transmitted to the client; if the display mode inputted from the web server is a field-shuttering display mode, an ES having the left-eye odd field and the right-eye even field is multiplexed sequentially and transmitted to the client; and if the display mode inputted from the web server is a frame-shuttering display mode, an ES having the left-eye odd field, left-eye even field, right-eye odd field and the right-eye even field is multiplexed sequentially and transmitted to the client.